

WHAT IS CLAIMED IS:

1. A cell searching method for mobile terminal in TDD-CDMA system, said method including the following steps:

5 a. searching the signal transmitted by base station according to pulse power;

b. if a signal being similar to the downlink synchronization signal is found successfully, a coarse time synchronization parameter will be gained;

10 c. based on the coarse time synchronization parameter, open a time searching window, and search for the downlink synchronous signals in the said time window; and

d. if it is failed in searching a downlink synchronous signal, search a downlink synchronous signal in the whole time period.

2. A method of claim 1, wherein step a includes the following steps:

a1. defining a match template;

15 a2. calculating the power of received signals;

a3. comparing all the received signals with the said match template.

3. A method of claim 2, wherein said match template's parameters are defined as follows:

H1 is the power threshold of guard period of the match template;

H2 is the power threshold of downlink synchronous signal of the match template;

L1 is the time of guard period of the match template;

5 L3 is the time of downlink synchronous signal of the match template.

4. A method of claim 2, wherein in step a2, the pulse power of the said signal can be achieved by adding the absolute value of the real part to the image part of the signal.

10 5. A method of claim 2, wherein step a3, also including a step of defining a variable of credit, which is used to measure the similarity between the received signals and match template.

6. A method of claim 5, wherein judging by the variable of credit, if the variable of credit touches the specified threshold, it is considered that the downlink synchronous signal is found.

15 7. A method of claim 2, wherein step a3 still includes following steps:

a3-1. detecting the guard period prior to signal pulse;

a3-2. detecting the signal pulse period;

a3-3. detecting the guard period post signal pulse.

8. A method of claim 7, wherein detecting the guard period prior to signal pulse includes: Comparing the signal pulse power with H1, if the signal pulse power is smaller than H1, the variable of credit increases a specified value; otherwise, the variable of credit decreases a specified value.

9. A method of claim 7, wherein detecting signal pulse period includes: Comparing the signal pulse power with H2, if the signal pulse power is higher than H1, the variable of credit increases a specified value; otherwise, the variable of credit decreases a specified value.

10. A method of claim 7, wherein checking guard period post signal pulse includes: Comparing the signal pulse power with H1, if the signal pulse power is lower than H1, the variable of credit increases a specified value; otherwise, the variable of credit decreases a specified value.

11. A method of claim 7, wherein during every pulse period of step a3, comparing the searched signal pulse power with the power of match template at every time point.

12. A method of claim 7, wherein during every pulse period of step a3, comparing the searched signal pulse power with the power of match template at the specified several detection points.

13. A mobile terminal including a searching device for performing cell search in TDD-CDMA system, wherein the searching device comprising:

a power pulse searching for getting a coarse time synchronous parameter by the signal emitted by pulse power searching base station;

a correlation searching means for opening a time searching window based on the coarse time synchronous parameter, and searching the downlink synchronous signals in the said time window; and

a controlling means for controlling the work of the power pulse searching means and correlation searching means and defining their parameters.

14. A mobile terminal of claim 13, wherein power pulse searching device includes:

power calculating device, which is used to calculate the power of the received signal;

match template device, which is used to define and store the parameters of the power match template; and

power matching device, which is used to compare the similarity between the power of the received signals and the power of the defined power match template.

15. A mobile terminal of claim 14, wherein the said power match template defines its parameters as follows:

H1 is the power threshold of guard period of the match template;

H2 is the power threshold of downlink synchronous signal of the match template;

L1 is the time of guard period of the match template;

L3 is the time of downlink synchronization signal of the match template.

5 16. A mobile terminal of claim 14, wherein the said power calculating device can achieve pulse power of the signal by adding the absolute value of the real part to the image part of the signal.

10 17. A mobile terminal of claim 14, wherein the said power matching device also defining a variable of credit, which is used to measure the similarity between the received signals and match template.

 18. A mobile terminal of claim 14, wherein the said power matching device is judged by the variable of credit, if the variable of credit touches the specified threshold, it is judged that the downlink synchronous signal is found.

15 19. A mobile terminal of claim 14, wherein the said power matching device includes a detection device, which is used to detect the guard period prior to signal pulse. the signal pulse period and the guard period post signal pulse.

20 20. A mobile terminal of claim 19, detecting guard period prior to signal pulse includes: Comparing the signal pulse power with H1, if the signal

pulse power is smaller than H1, the variable of credit increases a specified value; otherwise, the variable of credit decreases a specified value.

21. A mobile terminal of claim 19, wherein detecting signal pulse period includes: comparing the signal pulse power with H2, if the signal pulse power is higher than H1, the variable of credit increases a specified value; otherwise, the variable of credit decreases a specified value.

22. A mobile terminal of claim 19, wherein check guard period post signal pulse includes:

Comparing the signal pulse power with H1, if the signal pulse power is lower than H1, the variable of credit increases a specified value; otherwise, the variable of credit decreases a specified value.

23. A mobile terminal of claim 19, wherein the said power matching device compares the searched signal pulse power with the power match template at every time point.

24. A mobile terminal of claim 19, wherein the said power matching device compares the searched signal pulse power with the power match template in the several specified detection point.